

EVALUATING THE RELATIONSHIP BETWEEN PRIVATE CHILDCARE SERVICES AND MATERNAL LABOUR FORCE PARTICIPATION IN TÜRKİYE USING VECM

TÜRKİYE'DE ÖZEL ÇOCUK BAKIM HİZMETLERİ İLE ANNELERİN İŞGÜCÜNE KATILIMI ARASINDAKİ İLİŞKİNİN VECM İLE DEĞERLENDİRİLMESİ

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ABSTRACT

The study aims to examine the relationship between private childcare services and mothers' labour force participation. To this end, data from the 2007-2023 period are analysed using the Vector Error Correction Model (VECM) and also Granger Causality methods. According to the findings, the number of students enrolled in private kindergartens and nurseries, institutions affiliated with the Ministry of Family and Social Services [MoFSS], and nurseries opened in businesses negatively affects mothers' labour force participation in the long term. However, in the short term, these factors have a positive effect on mothers' labour force participation. Furthermore, the analysis results show that COVID-19 reduced mothers' labour force participation rates in both the long and short term, but this effect is more pronounced in the short term. According to the Granger causality test results, the number of students enrolled in private kindergartens and nurseries, institutions affiliated with the MoFSS, and nurseries opened in businesses does not statistically significantly predict mothers' labour force participation. In other words, these childcare services do not play a causal role in mothers' participation in the labour market. Conversely, the rate of mothers' participation in the labour force affects enrolment in these institutions.

Keywords: Private Childcare Services, Maternal Labour Force Participation, VECM, Granger Causality.

JEL Classification Codes: E71, E59, C01, C22.

ÖZ

Bu çalışma, özel çocuk bakım hizmetleri ile annelerin işgücüne katılımı arasındaki ilişkiyi incelemeyi amaçlamaktadır. Bu doğrultuda, 2007-2023 dönemi verileri, Vektör Hata Düzeltme Modeli (VECM) ve Granger Nedensellik metodları uygulanarak analiz edilmiştir. Elde edilen bulgulara göre, özel anaokulları ve kreşlere, Aile ve Sosyal Hizmetler Bakanlığı'na bağlı kurumlara ve işletmelerde açılan kreşlere kayıtlı öğrenci sayıları, uzun vadede annelerin işgücüne katılımını olumsuz yönde etkilemektedir. Ancak, kısa vadede bu faktörlerin annelerin işgücüne katılımı üzerinde olumlu bir etkisi bulunmaktadır. Ayrıca analiz sonuçları, COVID-19'un hem uzun hem de kısa vadede annelerin işgücüne katılım oranını azalttığını, ancak bu etkinin kısa vadede daha belirgin olduğunu göstermektedir. Granger nedensellik testi sonuçlarına göre, özel anaokulları ve kreşlere, Aile ve Sosyal Hizmetler Bakanlığı'na bağlı kurumlara ve işletmelerde açılan kreşlere kayıtlı öğrenci sayıları, annelerin işgücüne katılımını istatistiksel olarak anlamlı şekilde öngörememektedir. Diğer bir ifadeyle, bu çocuk bakım hizmetleri annelerin işgücü piyasasına katılımında nedensel bir rol oynamamaktadır. Buna karşılık, annelerin işgücüne katılım oranı, bu kurumlara yapılan kayıtları etkilemektedir.

Anahtar Kelimeler: Özel Çocuk Bakım Hizmetleri, Anne İşgücüne Katılımı, VHDM, Granger Nedensellik.

JEL Sınıflandırma Kodları: E71, E59, C01, C22.

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EXTENDED SUMMARY

Purpose and Scope:

According to 2024 data, the employment rate of women in Türkiye is 42.2%, well below the OECD average of 67.1 %. This significant difference points to the relatively low levels of women's employment in Türkiye and suggests that policy efforts to increase women's participation in the labour market need to be strengthened. In this context, the study aims to analyse the impact of access to private childcare services on mothers' labour force participation (lfp) in Türkiye. In this context, the number of students enrolled in private childcare institutions between 2007 and 2023 is analysed as a proxy for the accessibility of childcare services. The study also aims to identify policy interventions to understand the role of childcare services in low female lfp rates. The structure, access challenges and regional inequalities of childcare services provided by the private and public sectors in Türkiye are discussed. It also assesses how public subsidies, flexible working conditions and childcare policies affect mothers' lfp. Accordingly, the study presents a data analysis-based analysis to understand the scope and potential of private childcare services and their impact on mothers' lfp. The findings contribute to the development of recommendations on the necessity of various subsidy and regulation policies to increase women's lfp.

Design/methodology/approach:

In the study, the lfp rate of women aged 25-34 (married, cohabiting or living in the same household) is obtained from the International Labour Organisation database. The lfp of women aged 25-54 is taken into account since women in this age group are more likely to have one or more children between the ages of 0-6. In the study, children between the ages of 0-6 are considered. This is because it is thought that mothers need childcare services in this age group and access to private childcare services is critical. Private childcare services are represented by the number of students in kindergartens, pre-school classes, nursery schools, institutions affiliated to the MoFSS and nursery schools opened in enterprises within the scope of the Labour Law. Private pre-school education data are obtained from National Education Statistics. The data are analysed using the VECM and Granger causality methods. In addition, other analysis tools such as the VECM stability test, response functions and variance decomposition are also used in the study. The analysis is carried out by constructing two separate models of private childcare services. In the first model, the relationship between the number of students enrolled in private kindergartens and nursery schools affiliated to the Ministry of National Education [MoNE] and mothers' lfp is evaluated. In the other model, the relationship between the number of students enrolled in institutions not affiliated to the MoNE but affiliated to the MoFSS and the number of students enrolled in kindergartens opened in enterprises according to the Labour Law and the lfp of mothers is evaluated. In both models, the variable COVID-19, which is a negative shock that has the potential to affect lfp, is added as an exogenous variable.

Findings:

The findings show that the number of students enrolled in private kindergartens and nurseries, the number of students enrolled in institutions affiliated to the MoFSS and the number of students enrolled in nurseries opened in enterprises have a negative effect on mothers' lfp in the long run. However, in the short run, these variables have a positive effect on mothers' lfp. These findings suggest that private childcare services do not make a significant contribution to maternal employment in Türkiye. The main reason for this is that low-income families cannot access private childcare services due to high costs. Therefore, the impact of private childcare services on mothers' lfp remains limited. Moreover, the findings reveal that COVID-19 reduces female lfp in both the long and short run. However, this effect is found to be stronger in the short run. This can be interpreted as that COVID-19 causes a large shock in the labour market in the short run, but this effect gradually diminishes in the long run. The third important finding of the study is that the number of students enrolled in private kindergartens and day-care centres, institutions affiliated to the MoFSS and day-care centres opened in enterprises does not predict mothers' lfp in a statistically significant way. In other words, these childcare services do not play a causal role in mothers' labour market participation. On the contrary, the lfp rate of mothers affects the enrolment in these institutions.

Conclusion and Discussion:

Granger causality findings show that the need for private childcare has increased as more mothers join the labour force in Türkiye. However, in contrast to a demand-driven childcare market, it may be possible to encourage mothers' lfp by making the supply of private childcare services more flexible. According to the other findings of the study, the following recommendations are offered: Subsidies should be provided by the state to families who want to use private childcare services. Employers should offer childcare support to all female employees who request it, regardless of the number of female employees in the workplace. Necessary arrangements should be made in the Labour Law. An income test should be conducted and different childcare subsidies should be provided for different income groups. More childcare services should be provided for children aged 0-2 years. With the implementation of these recommendations, childcare services would become more flexible, the transition of mothers who want to work to the labour force would become easier, and the rates of maternal lfp and maternal employment would increase.

GENİŞLETİLMİŞ ÖZET

Amaç ve Kapsam:

2024 yılı verilerine göre, Türkiye'de kadınların istihdam oranı %42,2 düzeyinde olup, bu oran %67,1 olan OECD ortalamasının oldukça altındadır. Bu belirgin fark, Türkiye'de kadın istihdamının görece düşük seviyelerde seyrettiğine işaret etmekte ve kadınların işgücü piyasasına katılımının artırılmasına yönelik politika çabalarının güçlendirilmesi gerektiğini ortaya koymaktadır. Bu bağlamda, söz konusu çalışma, Türkiye'de özel çocuk bakım hizmetlerine erişimin, annelerin işgücüne katılımı üzerindeki etkisini analiz etmeyi amaçlamaktadır. Bu kapsamda, 2007-2023 yılları arasında özel çocuk bakım kurumlarına kayıtlı öğrenci sayıları, çocuk bakım hizmetlerine erişilebilirliği temsilen kullanılanlar incelenmiştir. Çalışma, kadınların işgücüne katılım oranlarının düşük olmasında çocuk bakım hizmetlerinin üstlendiği rolü anlamak için gerekli politika müdahalelerini belirlemeyi hedeflemektedir. Türkiye'de kamu ve özel sektör tarafından sunulan çocuk bakım hizmetlerinin yapısı, erişim zorlukları ve bölgesel eşitsizlikleri ele alınmaktadır. Ayrıca, kamu sübvansiyonlarının, esnek çalışma koşullarının ve çocuk bakım politikalarının annelerin işgücüne katılımını nasıl etkilediği değerlendirilmektedir. Bu doğrultuda, çalışmada özel çocuk bakım hizmetlerinin kapsamı, mevcut potansiyeli ve annelerin işgücüne katılımı üzerindeki etkilerini anlamak amacıyla veri analizine dayalı bir inceleme sunulmaktadır. Elde edilen bulgular, kadınların işgücüne katılımını artırmaya yönelik çeşitli sübvansiyon ve düzenleme politikalarının gerekliliğine dair öneriler geliştirilmesine katkı sağlamaktadır.

Yöntem:

Bu çalışmada 25-34 yaş aralığındaki (evli, birliktelik yaşayan veya birlikte oturan) kadınların işgücüne katılım oranı, Uluslararası Çalışma Örgütü veri tabanından alınarak kullanılmıştır. 25-54 yaş aralığındaki kadın işgücüne katılımı ise, bu yaş grubundaki kadınların genellikle 0-6 yaş aralığında bir veya daha fazla çocuğa sahip olma olasılığının yüksek olması nedeniyle dikkate alınmıştır. Bu çalışmada 0-6 yaş aralığındaki çocuklar ele alınmıştır. Çünkü annelerin bu yaş grubunda çocuk bakım hizmetlerine ihtiyaç duyduğu ve özel çocuk bakım hizmetlerine erişimin kritik olduğu düşünülmektedir. Özel çocuk bakım hizmetleri, anaokulu, okul öncesi sınıfı, kreşler ve Aile ve Sosyal Hizmetler Bakanlığı'na bağlı kurumlar ile İş Kanunu kapsamında işletmelerde açılan kreşlerdeki öğrenci sayılarıyla temsil edilmektedir. Özel okul öncesi eğitim verileri, Milli Eğitim İstatistikleri'nden alınmıştır. Veriler VECM ve Granger Nedensellik Yöntemi kullanılarak analiz edilmiştir. Ayrıca bu çalışmada VECM Stabilitate Testi, Tepki Fonksiyonları ve Varyans Ayrıştırması gibi öte analiz araçlarından da istifade edilmiştir. Analiz özel çocuk bakım hizmetlerine dair iki ayrı modelin inşa edilmesi ile gerçekleştirilmiştir. İlk modelde Milli Eğitim Bakanlığı'na bağlı özel anaokulu ve anasınıfındaki kayıtlı öğrenci sayıları ve annelerin işgücüne katılımı arasındaki ilişki değerlendirilmiştir. Diğer modelde ise Milli Eğitim Bakanlığı'na Bağlı olmayan fakat Aile ve Sosyal Hizmetler Bakanlığı'na bağlı olan kurumlardaki kayıtlı öğrenci sayıları ile İş Kanunu'na göre işletmelerde açılan kreşlerde kayıtlı olan öğrenci sayıları ile annelerin işgücüne katılımı arasındaki ilişki değerlendirilmiştir. Her iki modele de işgücüne katılımı etkileme potansiyeline sahip bir negatif şok olan COVID-19 değişkeni dışsal değişken olarak eklenmiştir.

Bulgular:

Bulgular, özel anaokulları ve kreşlere kayıtlı öğrenci sayıları, Aile ve Sosyal Hizmetler Bakanlığı'na bağlı kurumlara kayıtlı öğrenci sayıları ve işletmelerde açılan kreşlere kayıtlı öğrenci sayılarının, uzun vadede annelerin işgücüne katılımını olumsuz yönde etkilediğini göstermektedir. Ancak kısa vadede, bu değişkenlerin annelerin işgücüne katılımını olumlu yönde etkilediği belirlenmiştir. Bu bulgular, özel çocuk bakım hizmetlerinin Türkiye'de anne istihdamına önemli bir katkı sağlamadığını göstermektedir. Bunun temel nedeni, düşük gelirli ailelerin özel çocuk bakım hizmetlerine yüksek maliyetler nedeniyle erişememesidir. Dolayısıyla, özel çocuk bakım hizmetlerinin annelerin işgücüne katılımı üzerindeki etkisi sınırlı kalmaktadır. Ayrıca bulgular, COVID-19'un hem uzun hem de kısa vadede kadın işgücüne katılımını azalttığını ortaya koymaktadır. Ancak, bu etkinin kısa vadede daha güçlü olduğu belirlenmiştir. Bu durum, COVID-19'un kısa vadede işgücü piyasasında büyük bir şoka neden olduğu, ancak uzun vadede bu etkinin kademeli olarak azaldığı şeklinde yorumlanabilir. Çalışmanın üçüncü önemli bulgusu ise, özel anaokulları ve kreşlere, Aile ve Sosyal Hizmetler Bakanlığı'na bağlı kurumlara ve işletmelerde açılan kreşlere kayıtlı öğrenci sayılarının annelerin işgücüne katılımını istatistiksel olarak anlamlı şekilde öngöremediği yönündedir. Diğer bir ifadeyle, bu çocuk bakım hizmetleri annelerin işgücü piyasasına katılımında nedensel bir rol oynamamaktadır. Buna karşılık, annelerin işgücüne katılım oranı, bu kurumlara yapılan kayıtları etkilememektedir.

Sonuç ve Tartışma:

Granger nedensellik bulguları, Türkiye'de daha fazla annenin işgücüne katılımıyla birlikte özel çocuk bakımına olan ihtiyacın arttığını göstermiştir. Ancak, talep odaklı bir çocuk bakım piyasasının aksine, özel çocuk bakım hizmetlerinin arzını daha esnek hale getirerek annelerin işgücüne katılımının teşvik edilmesi mümkün olabilir. Çalışmanın diğer bulgularına göre şu öneriler sunulmaktadır: Özel çocuk bakım hizmeti almak isteyen ailelere devlet tarafından sübvansiyon sağlanmalıdır. İşverenler, işyerinde kadın çalışan sayısından bağımsız olarak, talep eden tüm kadın çalışanlara çocuk bakım desteği sunmalıdır. Bununla ilgili olarak İş Kanunu'nda gerekli düzenlemeler yapılmalıdır. Gelir testi yapılarak farklı gelir gruplarına göre farklı çocuk bakım sübvansiyonları uygulanmalıdır. 0-2 yaş aralığındaki çocuklar için daha fazla çocuk bakım hizmeti sağlanmalıdır. Bu önerilerin uygulanmasıyla birlikte, çocuk bakım hizmetleri daha esnek bir yapıya kavuşacak, çalışmak isteyen annelerin işgücüne geçişi kolaylaşacak ve anne işgücüne katılımı ile anne istihdamı oranları artırılabilecektir.

1. INTRODUCTION

It is emphasized several key factors for improving access to childcare services, including the starting age for preschool education, legal regulations aimed at enhancing childcare services, service hours in childcare centers, and the implementation of legal frameworks that allow flexible environments based on demand (World Bank [WB], 2022). The availability of comprehensive childcare policies within a society is closely linked to maternal lfp. While the female lfp rate in OECD countries averages 67.1%, this rate stands at 42.2% in Türkiye (The Organization of Economic Co-operation and Development [OECD], 2024). The exclusion of women from the labour force may slow down economic growth and development. Therefore, lfp rates should be considered not only for men but also for women, and appropriate regulatory measures should be implemented to ensure gender-inclusive economic policies.

Childcare services are provided worldwide through either public or private institutions. In some countries, these services are predominantly subsidized and managed by the public sector, while in others, they are primarily operated by private providers. In Continental Europe, childcare services are rationed, whereas in the United States (US) and the United Kingdom (UK), they are largely provided by private institutions (Del Boca, 2015). In the US, the government generally regulates and subsidizes childcare within the private market for infants and toddlers (Morrissey, 2017, p.20). In Türkiye, a mixed childcare system operates, where both public and private institutions provide services. However, public childcare services are often part-time, restricted to children aged three and above, and offered intermittently, which creates significant challenges for full-time working mothers. As a result, many women either face barriers to lfp or must rely on private childcare services (Hüseyinli & Hüseyinli, 2016, p. 131).

Moreover, the Working Group Report on the Reconciliation of Work and Family Life highlights the existence of a societal structure in Türkiye that places the primary responsibility for childcare on women (The Ministry of Labour and Social Security [MoLSS], 2007). This structural norm further exacerbates the challenges women face in balancing employment and caregiving responsibilities. Additionally, access to childcare services in Türkiye is unevenly distributed across different regions, leading to significant regional disparities in childcare accessibility (Social Policy Forum, 2009). This disparity further deepens inequalities in maternal lfp and underscores the need for comprehensive policy interventions to improve childcare accessibility and affordability.

Although private childcare centres offer more flexible working conditions and do not impose age restrictions, making them appear ideal for full-time working mothers, affordability remains a significant challenge—particularly in countries like Türkiye, where poverty rates are high. Lower-income households often cannot afford private childcare services, limiting their accessibility to a large segment of the population (Social Policy Forum, lfp in Türkiye is crucial for understanding the role of private childcare and its existing potential. Such an analysis would also provide insights into necessary policy interventions to enhance childcare accessibility and affordability. Based on these findings, various childcare subsidy policies could be proposed to increase maternal lfp. A key policy question remains whether optimized childcare services would lead to higher maternal lfp. In this regard, the present study investigates the relationship between private childcare services and maternal lfp in Türkiye from 2007 to 2023, using the enrolled student numbers in private childcare institutions as a representative measure of accessibility.

2. OVERVIEW OF PRIVATE CHILD CARE SERVICES IN TÜRKİYE

In Türkiye, according to Article 15 of Regulation No. 2552 of Labor Law No. 4857, private companies employing more than 150 female workers are required to open daycare centers for their employees' children aged 0-6. However, the employment package introduced in 2008 offered employers the alternative of purchasing this service from the private sector. In this context, private kindergartens, nurseries and childcare services affiliated with businesses have become increasingly widespread in Türkiye. As of 2023-24, a total of 353,226 children benefit from these services (MoNE, 2024). Table 1 presents the scope of private childcare services in Türkiye.

Childcare services in women's lfp are evaluated in the context of "reproduction economy" in feminist economics literature. Becker's (1981) "household production theory" emphasizes how childcare costs shape employment decisions by considering women's labour supply together with their domestic production obligations. Accordingly, the availability of public or private care services plays a decisive role in women's time allocation (Folbre, 1994).

Furthermore, Becker and Lewis (1973) provided a micro-based explanation of the care economy by arguing that childcare costs directly affect women's fertility and labour decisions.

Employer-sponsored childcare services have been associated with increased productivity, workplace diversity, employee retention, work-life balance, enhanced corporate reputation and improved employer-employee relations (Hegewisch, 2017). A notable example from Türkiye is Martur, which signed agreements with four nurseries for the children of its female employees in 2015 and 2017. The company covered both childcare fees and transport costs, which led to an growth in the number of female job applicants and a higher employee retention rate. In addition, employee turnover decreased by 25% and production quality improved (Essmat, 2017). The expansion of employer-sponsored childcare services is expected to positively affect lfp rates. However, the lack of standardised regulations and difficulties in cost estimation may be barriers to the widespread adoption of such services (Hegewisch, 2017).

Esping-Andersen's (1999) typology of welfare states is also important to explain the impact of institutional and public childcare on women's employment. As Türkiye relies on a family-based care model similar to the "Southern European welfare regime," the inadequacy of public childcare services hinders women's participation in employment. In contrast, in Scandinavian countries, state-subsidised childcare systems have significantly increased women's employment rate (Misra, et al. 2011). Therefore, the care services undertaken by the private sector in Türkiye fulfil a complementary function in the area where the welfare state falls short.

Moreover, the care economics literature defines childcare services as "social infrastructure investment" (Elson, 2017). This approach argues that investments in childcare services, just like physical infrastructure, support economic growth and contribute to total factor productivity by increasing women's participation in the labour force. Therefore, the expansion of private childcare services should be seen as a factor affecting not only micro-level employment decisions but also macro-level economic development. This perspective is in line with the OECD's (2023) "Inclusive Growth Framework", which considers investments in childcare services as one of the key elements of inclusive growth.

Table 1. The Scope and Scale of Private Childcare Services in Türkiye

The Scope of Private Childcare Services in Türkiye	2023-24 Enrolled Student Numbers
1-Institutions affiliated with the MoNE	
Private kindergartens (Provides services for children aged 3-6)	215,528
Private nursery class (provides services for children aged 5-6)	55,882
2-Institutions affiliated with the MoFSS	
Nurseries and Day Care Centres (Nursery services are provided for children aged 0-3, while day care centre services are provided for children aged 3-6.) Furthermore, nursery services have begun to be offered in workplaces based on the Labour Law. — Private workplaces employing more than 150 female workers are now required to provide nursery services for their employees' children aged 0-6 *Nurseries established in workplaces under the Labour Code were transferred to the MoFSS in 2015.	81,816
Total	353,226

Source: (MoNE, 2024).

There are notable gaps in the literature on the relationship between the availability of private childcare and maternal or parental employment (Morrissey, 2017). This gap is particularly important as the number of private childcare providers has increased significantly around the world in recent years. Childcare systems vary in different regions. In continental Europe, childcare services are rationed, while in the UK and the US they are predominantly provided by private organisations (Del Boca, 2015). In the US, the private childcare market for infants and toddlers is generally regulated and subsidised. Crosby et al. (2005) have designed various employment-enhancing programmes such as earnings supplements and mandatory attendance initiatives. These programmes have led to an increase in mothers' preference for private, centre-based childcare services.

Studies conducted in Türkiye also support these global trends. For example, The Turkish Industry and Business Association [TIBA] (2020) and The Economic Policy Research Foundation of Türkiye [EPRFT] (2019) reports

reveal that cost and access barriers to childcare services are the determinants of low female employment rates in Türkiye. At the same time, The State Planning Organisation [SPO] (2001) and The Ministry of Family and Social Policies [MoFSP] (2018) reports emphasise that public care capacity is very limited in eastern and southeastern provinces due to regional inequalities. TurkStat (2024) data show that only 11% of mothers with children between the ages of 0-6 can benefit from any institutional care service. These findings confirm that inadequacies in childcare infrastructure systematically hinder women's transition to the labour market. Furthermore, Yentürk and Sazak (2021) report that childcare services in Türkiye are largely concentrated in urban centres, while the number of private nurseries and kindergartens in rural areas is quite low. This spatial imbalance reinforces the geographical inequality of employment. Therefore, policies for childcare services need to be integrated with regional planning.

Research shows that policies aimed at increasing access to paid childcare influence families' childcare choices. Programmes that offer more efficient, generous and comprehensive childcare services for all age groups (infants, pre-school and school-age children) have resulted in a shift from home-based childcare to centre-based childcare, with the most significant impact observed among pre-school-age children. Havnes and Mogstad (2011) analysed the expansion of subsidised childcare in Norway. Their findings suggest that subsidised childcare leads to a shift from informal childcare to formal childcare rather than increasing maternal employment. They find only a weak causal relationship between subsidised childcare and maternal employment, but emphasise that access to childcare remains a driving force behind mothers' labour market participation. Viitanen (2011) conducted an empirical study on the impact of childcare vouchers on lfp and the use of private and public childcare services. The voucher system encouraged families to switch from informal childcare to private childcare. The use of private childcare increased for children aged 3-5 years, but there was no significant change for children aged 0-2 years. lfp increased by 5% in areas with childcare shortages. These findings provide a critical clue for Türkiye in terms of policy design: It is not enough to increase childcare services only on the supply side; they also need to be supported on the demand side through subsidies and income support mechanisms (TIBA, 2020). Thus, private childcare services can become both accessible and sustainable, facilitating mothers' return to employment. In addition, the implementation of the regional incentive systems envisaged in the 2023 Women's Employment Strategy Document (Ministry of Family and Social Services, 2023) in this field would both increase the supply flexibility of care services and strengthen the role of the private sector in this field.

3. DATA AND MODEL

This article aims to examine the relationship between the availability of special childcare services and mothers' lfp for the period 2007-2023, including the COVID-19 external shock.

In general, maternal employment refers to the part-time/full-time employment rate of women with at least one child aged 0-14. Maternal lfp defines the total of employed and job-seeking women at least one child aged 0-14. The study highlights the lfp as a pathway to the country's potential workforce. Türkiye has the lowest maternal employment in 2013 (OECD Family Database, 2023). Moreover, Türkiye has the lowest female lfp rate among OECD countries (OECD, 2024). This article uses data from the ILOSTAT database on the lfp rate of women aged 25-34 (married/cohabiting/living together). This is because women in this age group are more likely to have one or more children aged 0-6.

This article is based on the assumption that mothers require childcare services for children aged 0-6. The need for special childcare services for the 0-6 age group is based on pre-school enrolment figures, nursery schools, crèche classes, and crèches opened in businesses under the MoFSS and the Labour Law. Data on special pre-school education has been obtained from the National Education Statistics.

Table 2. Variables in Models

Variables	Var Code	Sample Period ²	Source
Dependent Variable			
Female lfp aged 25-54 (married/union/cohabiting)	flfp	2007 -2023	ILOSTAT

Variables	Var Code	Sample Period ²	Source
Independent Variables			
<i>Pre-primary private education</i>			
<i>1. Private institutions related to MoNE</i>			
a.Enrolled student numbers in kindergartens (private) *Turkish students are taken into account; students in the minority, international and summer education categories are not taken into account.	spk	2007 -2023	National Education Statistics
b.Enrolled student numbers in nursery-class (private) *Turkish students are taken into account; students in the minority, international and summer education categories are not taken into account.	spn		
<i>2. Private institutions not related to MoNE</i>			
Number of students registered with MoFSS and creches opened in enterprises based on the Labour Law. *Creshes opened in enterprises based on the Labour Law were included to institutions related to MoFSS in 2015.	ashbikk	2007 -2023	National Education Statistics

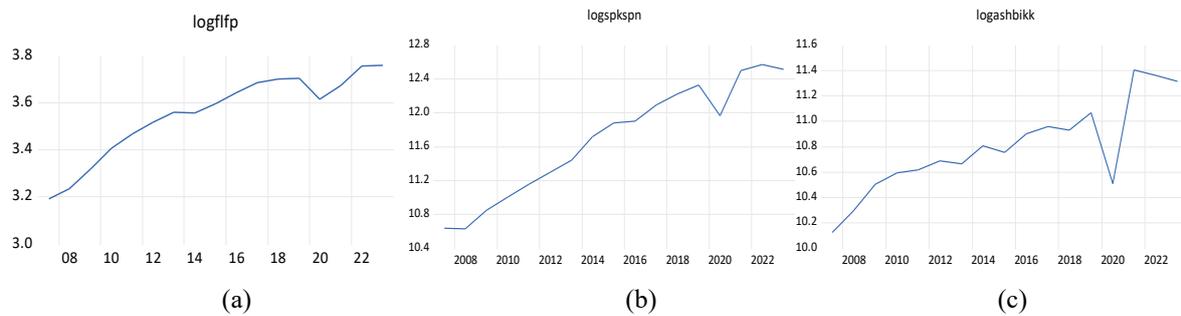
The sample examined in the study covers the period 2007–2023. The descriptive statistics for all variables are provided in Table 3.

Table 3. Descriptive Statistics

Variables	Mean	Median	Maximum	Minimum	Std Dev	Obs
logflfp	3.552058	3.595804	3.759827	3.191381	0.175198	17
logspkspn	11.68848	11.88345	12.57003	10.62980	0.661741	17
logashbikk	10.79392	10.75407	11.40555	10.12491	0.358282	16

Time series for all series are presented in Figures 1.

Figure 1. Series in Models



The two models, model (1) and model (2), containing the series given above are also presented. Where t states time, \logflfp_t represents women's lfp, \logspkspn_t states the number of students enrolled in private kindergartens and nurseries, and \logashbikk_t states the total number of students enrolled in institutions affiliated with the MoFSS and the number of students in nurseries opened in businesses under the Labour Law.

$$\logflfp_t = \theta_0 + \theta_1 \logspkspn_t + \theta_2 \text{dummy} \text{ covid} 19_t + \delta_t \quad (1)$$

$$\logflfp_t = \alpha_0 + \alpha_1 \logashbikk_t + \alpha_2 \text{dummy} \text{ covid} 19_t + \sigma_t \quad (2)$$

Due to the fact that the effects of such extraordinary processes should not be overlooked, dummy variables are commonly included in models. Dabla-Norris and Bal Gündüz (2012) use a monetary policy shock as a dummy variable to represent the banking crisis of the past two years. $\text{dummy} \text{ covid} 19$ incorporates the COVID-19 pandemic into the model as an exogenous shock. Ankargren and Lyhagen (2018) estimated both short-term dynamics and adjustment parameters using VECM with exogeneity constraints and obtained more efficient results

4. METHODOLOGY

Vektör Otoregresif (VAR) modelde, her bir içsel değişken kendi gecikmeli değeriyle temsil edilir. Bu yöntem, tek değişkenli otoregresif modeli çok değişkenli bir modele dönüştürerek, birçok zaman serisi değişkeninin eşzamanlı olarak modellenmesini sağlar.

Engle and Granger (1987) developed the cointegration error correction model by combining the error correction model and the concept of cointegration. When a cointegration relationship is observed between variables, the error correction model can be derived from the vector autoregressive (VAR) model. Within the VAR model framework, each equation follows an autoregressive distributed lag structure. Thus, the Vector Error Correction (VEC) model is expressed as a VAR model based on cointegration constraints. Therefore, the presence of cointegration within the VEC model indicates that, despite significant short-term fluctuations, the model has long-term equilibrium relationships between its internal variables and directs them towards their cointegrated states.

Assuming $y_t = (y_{1t}, y_{2t}, y_{3t}, \dots, y_{kt})'$ as dimensional k stochastic time series, $t=1, 2, \dots, T$ and $y_t \sim I(1)$, each $y_{it} \sim I(1)$, $i=1, 2, \dots, k$ is subject to the influence of k, d-dimensional external time series, $x_t = (x_{1t}, x_{2t}, x_{3t}, \dots, x_{dt})'$ Under these conditions, the vector autoregressive (VAR) model is as follows:

$$y_t = A_1 y_{t-1} + A_2 y_{t-2} + \dots + A_p y_{t-p} + B x_t + \mu_t, \quad t = 1, 2, \dots, T \quad (3)$$

If y_t , namely, if endogenous variables are not affected by a d-dimensional exogenous time series, the VAR model is simplified as follows:

$$y_t = A_1 y_{t-1} + A_2 y_{t-2} + \dots + A_p y_{t-p} + \mu_t, \quad t = 1, 2, \dots, T \quad (4)$$

When the cointegration transformation is applied to Equation (4), it can be written as follows:

$$\Delta y_t = \Pi y_{t-1} + \sum_{i=1}^{p-1} r_i \Delta y_{t-i} + \mu_t \quad (5)$$

Where

$$\begin{aligned} \Pi &= \sum_{i=1}^p A_i - I, \\ r_i &= \sum_{j=i+1}^p A_j \end{aligned} \quad (6)$$

If there is a cointegration relationship between the variables, after that $\Pi y_{t-1} \sim I(0)$, Equation (5) can be formulated as follows:

$$\Delta y_t = \alpha \beta' y_{t-1} + \sum_{i=1}^{p-1} r_i \Delta y_{t-i} + \mu_t \quad (7)$$

Where $\beta' y_{t-1} = ecm_{t-1}$ is an error correction term and captures the long-term equilibrium relationship between variables. Accordingly, the final form is as follows:

$$\Delta y_t = \alpha ecm_{t-1} + \sum_{i=1}^{p-1} r_i \Delta y_{t-i} + \mu_t \quad (8)$$

Equation (8) represents the VECM, which takes into account short-term dynamic adjustments subject to long-term equilibrium constraints.

5. RESULTS

5.1. Stationary Test

Within this framework, the ADF, PP Test and DF GLS Tests are applied to test whether the variables had unit roots, and the test results are presented in Table 4. The null hypothesis states that the variable has a unit root. The null hypothesis is rejected, and all variables are made stationary by taking the first difference.

Table 4. Results of ADF, DF-GLS and PP Unit Root Tests without Structural Break

	Variables	ADF	DF-GLS	PP
Level	$logflfp_t$	-2.375544	-1.074236	-2.373086
	$logspkspn_t$	-1.398064	-0.666958	-1.058752
	$logashbikk_t$	-1.213547	-1.813327	-1.885227
First-order difference	$logflfp_t$	-2.862464*	-2.979177***	-2.873738*
	$logspkspn_t$	-4.315837***	-5.484827***	-5.956633***
	$logashbikk_t$	-6.790853***	-7.039097***	-7.279763***

Note: The cut-off point has been included in the test equation.

In the subsequent sections of the study, a breakpoint unit root test is applied to test whether unit roots and structural breaks should be included in the series. The results of the breakpoint test are shown in Table 5. The null hypothesis states that the variable contains a unit root. The null hypothesis accepted that the $logflfp$, $logspkspn$, and $logashbikk$ variables are non-stationary at the 1% significance level. However, all series are stationary when first-order differences are taken, and the $logflfp$ and $logspkspn$ variables showed structural breaks in 2020. As is known, the COVID-19 pandemic began in Türkiye in March 2020, so the test result is consistent with the theory.

Table 5. Results of Unit Root Test with Break Test

	Variables	Minimum test stat	Break date	lag
Level	$logflfp_t$	-3.061586	2020	0
	$logspkspn_t$	-1.751856	2020	0
	$logashbikk_t$	-3.669284	2020	0
First-order difference	$logflfp_t$	-4.498589**	2020	0
	$logspkspn_t$	-11.63139***	2020	0
	$logashbikk_t$	-12.61582***	2015	0

Note: The break selection has been chosen to minimise the Dickey-Fuller t-statistic, with the cut-off type selected as the innovation endpoint. The lag length is set to 0, while the maximum lag is set to 1. The Schwarz criterion is used for the lag length method. The test specification is the intercept.

5.2. VAR Model Estimation

The fundamental challenge in VAR models is determining appropriate lag lengths for endogenous variables (Zou, 2018). In the study, lag length criteria and the AR Roots Plot are used to determine optimal lag lengths for endogenous variables. The results obtained for VAR models are presented in Table 6.

Table 6. Lag Intervals for Endogenous

Models	Lag	LogL	LR	FPE	AIC	SC	HQ
Model I	0	17.82466	NA	0.000544	-1.843289	-1.654475	-1.845300
	1	52.00001	50.12384	9.97e-06	-5.866668	-5.489041	-5.870691
	2	63.62870	13.95442*	3.86e-06*	-6.883826*	-6.317386*	-6.889860*
Model II	0	18.35614	NA	0.000507	-1.914152	-1.725339	-1.916163
	1	47.76644	43.13511	1.75e-05	-5.302192	-4.924566	-5.306215
	2	56.04185	9.930488*	1.06e-05*	-5.872247*	-5.305806*	-5.878280*

According to the test results, the optimal lag order for VAR Model I and Model II has been determined as 2. The estimation results of the VAR Models are presented in Table 7. $dummyscovid19$ has been added to the VAR Models as an exogenous shock. This allows for separating the effects of the shocks, thereby making the results obtained more accurate.

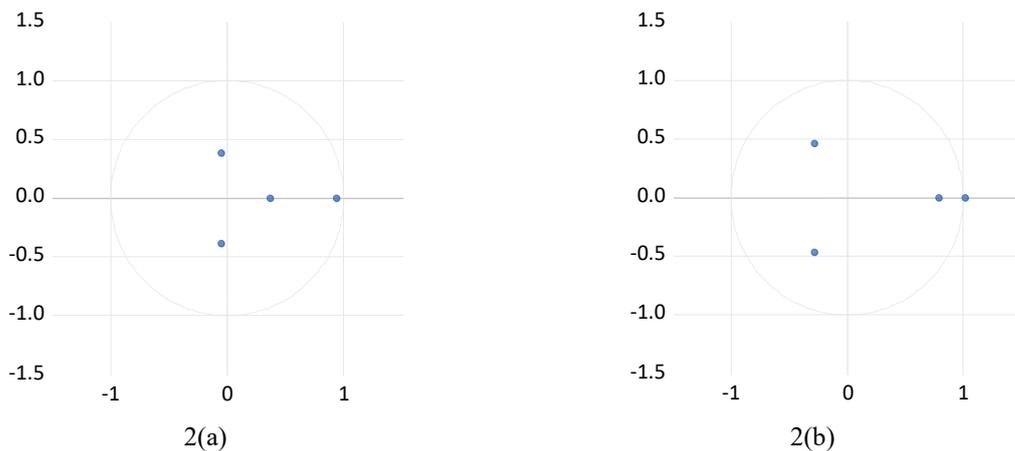
Table 7. The VAR Models Estimations

Model I			Model II		
Variables	logflfp	logspkspn	Variables	logflfp	logashbikk
logflfp(-1)	0.429652 (0.19947) [2.15402]	-2.146808 (0.76446) [-2.80827]	logflfp(-1)	0.315984 (0.29112) [1.08539]	-4.983384 (2.02182) [-2.46481]
logflfp(-2)	0.098621 (0.16771) [0.58803]	2.301782 (0.64277) [3.58101]	logflfp(-2)	0.398179 (0.18692) [2.13021]	4.120922 (1.29814) [3.17449]
logspkspn(-1)	0.103968 (0.04271) [2.43415]	0.764842 (0.16370) [4.67232]	logashbikk(-1)	0.104238 (0.04844) [2.15205]	0.925119 (0.33638) [2.75018]
logspkspn(-2)	-0.017817 (0.03927) [-0.45373]	0.102224 (0.15050) [0.67924]	Logashbikk(-2)	-0.025019 (0.03721) [-0.67231]	0.338940 (0.25845) [1.31146]
c	0.716674 (0.15049) [4.76218]	1.265230 (0.57677) [2.19365]	c	0.218791 (0.33319) [0.65666]	0.519850 (2.31394) [0.22466]
dummyscovid19	-0.122783 (0.02156) [-5.69524]	-0.545723 (0.08263) [-6.60480]	dummyscovid19	-0.129192 (0.02235) [-5.78112]	-0.748540 (0.15520) [-4.82311]

Although the log-likelihood functions of the VAR models are relatively large, the AIC value is low. This indicates that the models have high explanatory power. The stationarity test results for the VAR models are presented in Figure 2. According to Figure 2, the modulus of the inverse of each characteristic root is within the circle for all VAR models. This result indicates that the lag orders are appropriate for the VAR models and that the VAR models are stable.

Figure 2. Inverse Roots of Autoregressive (AR) Characteristic Polynomial

Inverse Roots of AR Characteristic Polynomial for Model I Inverse Roots of AR Characteristic Polynomial for Model II



5.3. Cointegration Test

An important detail here is selecting the appropriate cointegration test and determining the optimal lag order (Zou, 2018). Generally, the existence of a cointegration relationship between variables in VAR models is assessed using the Johansen Cointegration Test (Johansen & Juselius, 1990).

Table 8. Results of Cointegration Test

Models	Hypothesized No of CE(s)	Eigenvalue	Trace statistic	Critical value for 0.05	P value.**
Model I	None*	0.821291	27.44816	15.49471	0.0005
	At Most 1	0.212259	3.340212	3.841465	0.0676
Model II	None*	0.806695	24.91798	15.49471	0.0014
	At Most 1	0.127481	1.909199	3.841465	0.1671

Models	Hypothesized No of CE(s)	Eigenvalue	Max-ieigenvalue statistic	Critical value for 0.05	P value.**
Model I	None*	0.821291	24.10795	14.26460	0.0010
	At Most 1	0.212259	3.340212	3.841465	0.0676
Model II	None*	0.806695	23.00878	14.26460	0.0016
	At Most 1	0.127481	1.909199	3.841465	0.1671

Note: The trace and maximum eigenvalue tests indicate a cointegration equation for Model I at the 5% significance level. For Model II, both tests indicate the existence of two cointegration equations at the same significance level. In this case, the trace and maximum eigenvalue statistics indicate that the null hypothesis is rejected at the 5% significance level.

**MacKinnon-Haug-Michelis (1999) p-values.

The Johansen cointegration test is applied to examine the existence of long-term relationships between variables in the models. The trace test null hypothesis indicates the absence of a cointegration relationship, while the maximum eigenvalue test null hypothesis indicates the existence of a cointegration relationship. In the models, the trace test and maximum eigenvalue test identified a cointegration equation at the 5% significance level. These results indicate the existence of long-term equilibrium relationships between the variables. The results obtained are presented in Table 8.

For the models, predictions are made using VECM because, despite the long-term relationship between the variables, they are unbalanced in the short term (Zou, 2018). In other words, short-term imbalance and dynamic structure are expressed as VECM.

If the lag order in the VAR model is 2, the lag order corresponding to the VECM must be 1 (Zou, 2018). Therefore, since the lag order in the VAR model is set to 2 for the models in this paper, the lag order in the VECM is applied as 1. The results of the cointegration equation, which shows the long-term relationship between the variables, are presented in Table 9.

According to Model I, a 1% increase in spkspn (the number of students in private kindergartens and the number of students enrolled in private nursery classes) causes a 0.18 point decrease in flfp. The exogenous shock dummy covid19 causes a 0.03 point decrease in flfp.

According to Model II, a one% increase in ashbikk (the number of students enrolled in nurseries and daycare centres affiliated with the MoFSS, and the number of students enrolled in nurseries opened or used in businesses under the Labour Law) causes a 0.27 point decrease in flfp. The external shock dummy covid-19 causes a 0.07 point decrease in flfp.

Table 9. Results of Cointegration Equation

Models	Cointegrating Eq:	CointEq1
Model I	logflfp (-1)	1
	lognsknsn (-1)	-0.186125 [-9.62697]
	c	-1.382064
	dummycovid19	-0.028281

Models	Cointegrating Eq:	CointEq1
Model II	logflfp (-1)	1
	logashbikk (-1)	-0.274236 [-4.16554]
	c	-0.594413
	dummycovid19	-0.074949

Note: Deterministic trend characteristics include the cointegration constant but do not include the trend. dummycovid19 is used as an exogenous variable for Models I and II.

The cointegration equations are as follows:

$$\logflfp_{t-1} = -0.186125 \logspkspn_{t-1} - 0.028281 \text{dummycovid19}_{t-1} - 1.382064 \quad (9)$$

$$\logflfp_{t-1} = -0.274236 \logashbikk_{t-1} - 0.074949 \text{dummycovid19}_{t-1} - 0.594413 \quad (10)$$

The VECM estimation results and tests are presented in Table 10.

According to Model I, deviations from long-term equilibrium in the previous period are corrected by 48% in the current period. In the short term, a 1% change in logspkspn is associated with an average 0.01% increase in logflfp, holding other factors constant. Additionally, the exogenous shock COVID-19 corresponds to an average 0.14% decrease in logflfp in the short term, assuming other conditions remain unchanged. Relatively high R-squared values and low SC and AIC criterion values emphasise that the model estimates are consistent and reasonable.

According to Model II, deviations from long-term equilibrium in the previous period are corrected by 28 % in the current period. In the short term, 1 % change in logashbikk is associated with an average 0.02 % increase in logflfp, holding other factors constant. Additionally, the exogenous shock COVID-19 corresponds to an average 0.15% decrease in logflfp in the short term, assuming other conditions remain unchanged. Relatively high R-squared values and low SC and AIC criterion values indicate that the model estimates are reasonable and appropriate.

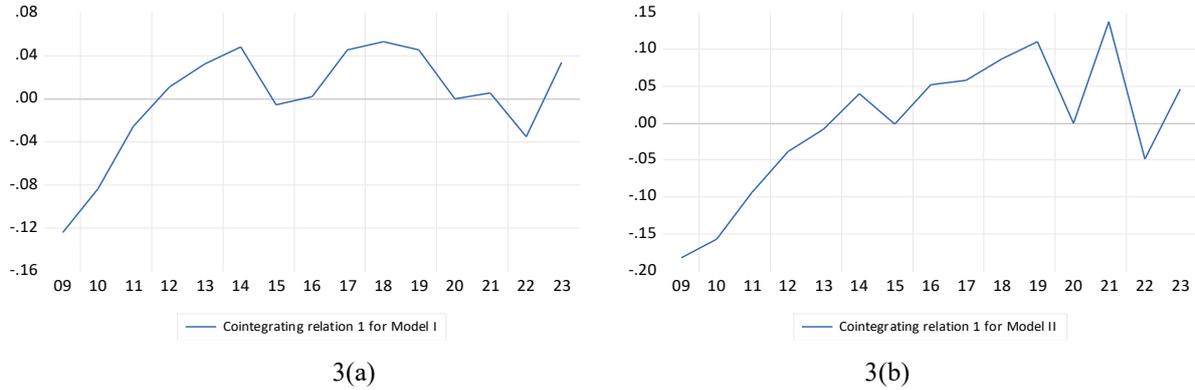
Table 10. VECM Estimation Results and Tests

Models	Error Correction:	D (logflfp)	D (logsknsn)
Model I	CointEq1	-0.482540 [-4.81385]	-0.527379 [-1.11142]
	D(logflfp(-1))	-0.089938 [-0.61351]	-1.753847 [-2.52738]
	D(logspkspn(-1))	0.015681 [0.46121]	-0.237051 [-1.47291]
	c	0.045416 [6.55719]	0.261431 [7.97379]
	dummycovid19	-0.136951 [-6.83589]	-0.593561 [-6.25882]
	R-squared	0.876804	0.840944
	Log likelihood		60.22105
	Akaike information criterion		-6.429473
	Schwarz criterion		-5.863033
Models	Error Correction:	D (logflfp)	D (logashbikk)
Model II	CointEq1	-0.283251 [-4.05468]	-0.527379 [-1.11142]
	D(logflfp(-1))	-0.396159 [-2.55987]	-1.753847 [-2.52738]
	D(logashbikk(-1))	0.025659 [1.15361]	-0.237051 [-1.47291]
	c	0.057724 [7.50440]	0.261431 [7.97379]
	dummycovid19	-0.150343 [-7.24424]	-0.593561 [-6.25882]
	R-squared	0.872437	0.840944
	Log likelihood		56.03093
	Akaike information criterion		-5.870791
Schwarz criterion		-5.304350	

Note: dummycovid19 has been used as an external variable for Models I and II.

The zero mean line seen in the figures indicates a stable and long-term equilibrium relationship between the variables. The cointegration relationships for both models are shown in Figures 3(a) and 3(b).

Figure 3. Cointegrating Relations for All Models



5.4. Granger Causality Test

Granger nedensellik testi değişkenler arasındaki nedensel ilişkileri incelemek için uygulanır. X değişkeni Y'nin tahmin edilmesine katkıda bulunuyorsa, yani X'in geçmiş değerleri, kendi geçmiş değerlerini zaten içeren Y'nin regresyonuna eklendiğinde modelin açıklayıcı gücü önemli ölçüde artıyorsa, X'in Y'nin Granger nedeni olduğu söylenir (Zou, 2018). Sıfır hipotezi, Granger nedenselliğinin mevcut olmadığını belirtir. Test sonuçları Tablo 11'de sunulmuştur.

Table 11. Result of the Granger Causality Test

	Excluded	Chi2	df	p value	The primary hypothesis
					<i>Dep Var: D(logflfp)</i>
Model I	D(logspkspn)	0.212715	1	0.6446	Accept
					<i>Dep Var: D(logspkspn)</i>
	D(logflfp)	6.387657	1	0.0115	Refuse
					<i>Dep Var: D(logflfp)</i>
Model II	D(logashbikk)	1.330817	1	0.2487	Accept
					<i>Dep Var: D(logashbikk)</i>
	D(logflfp)	14.21115	1	0.0002	Refuse

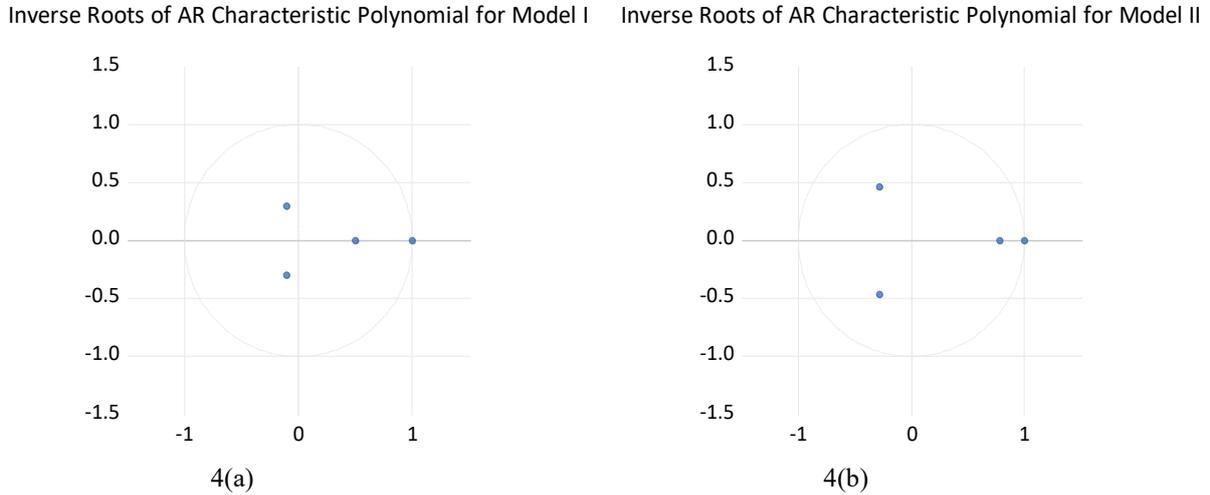
Note: dummycovid19 has been used as an external variable for Models I and II.

In Model I, logspkspn is not a Granger cause of logflfp, but logflfp is a Granger cause of logspkspn. In Model II, logashbikk is not a Granger cause of logflfp, but logflfp is a Granger cause of logashbikk. The Granger causality test results indicate that there is Granger causality and a certain reciprocity between the variables in the short term.

5.5. VECM Stability Test

According to the residue stability test results for models, it is observed that only one residue has a root of one, while the roots of the other residues are less than one. The test results are presented in Figures 4.

Figure 4. Residual Stability Test of ECM Model



Diagnostic tests are applied to all models, and the test results are presented in Table 12. The LM test statistics state that the residuals of VEC Models I and II do not contain autocorrelation, the Jarque-Bera test statistics state that the residuals of VEC Models I and II are normally distributed at the 5% significance level, and the White test statistics state that the residuals of VEC Models I and II do not contain heteroscedasticity.

Table 12. Diagnostisc Tests

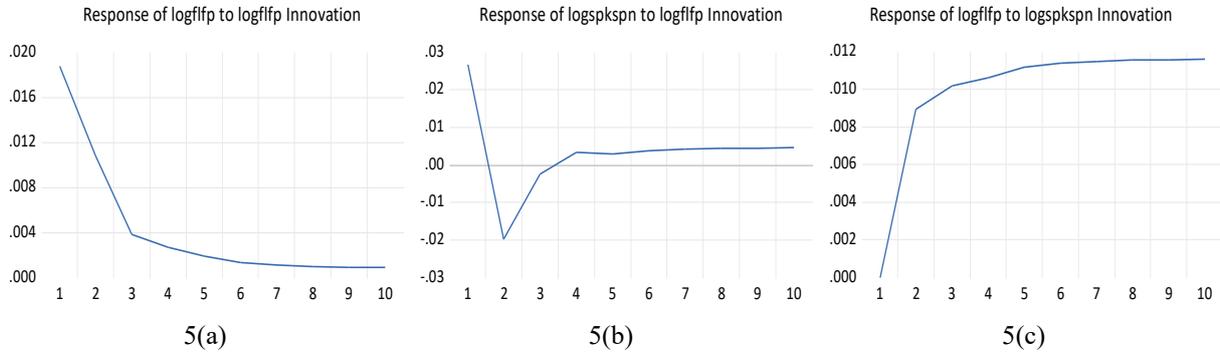
Models	Tests	stat	p value	
Model I	VEC Residual Serial Correlation LM Test	2.016742 (lag 1)	0.7338	
		6.246380 (lag 2)	0.1834	
	Skewness (chi-sq)	0.356189	0.8369	
	VEC Residual (Dornik Hansen) Normality Tests	Kurtosis (chi-sq)	2.659180	0.2646
		Jarque-Bera Test	3.015369	0.5553
	VEC Residual Heteroskedasticity White Test (No Cross Term) (chi-sq)	12.81927	0.9148	
Model II	VEC Residual Serial Correlation LM Test	4.135387 (lag 1)	0.3900	
		4.588768 (lag 2)	0.3342	
	Skewness (chi-sq)	1.943476	0.3784	
	VEC Residual (Dornik Hansen) Normality Tests	Kurtosis (chi-sq)	0.865387	0.6488
		Jarque-Bera Test	2.808863	0.5903
	VEC Residual Heteroskedasticity White Test (No Cross Term) (chi-sq)	24.12236	0.2872	

5.6. Impulse Response Function

Additional analyses such as impulse response functions and variance decompositions assess the model's dynamic effect in response to specific shocks and the interaction between the two variables. The results for a total period of 10 periods are presented in Figures 5(a), 5(b), 5(c), 6(a), 6(b) and 6(c) for Model I and Model II, respectively.

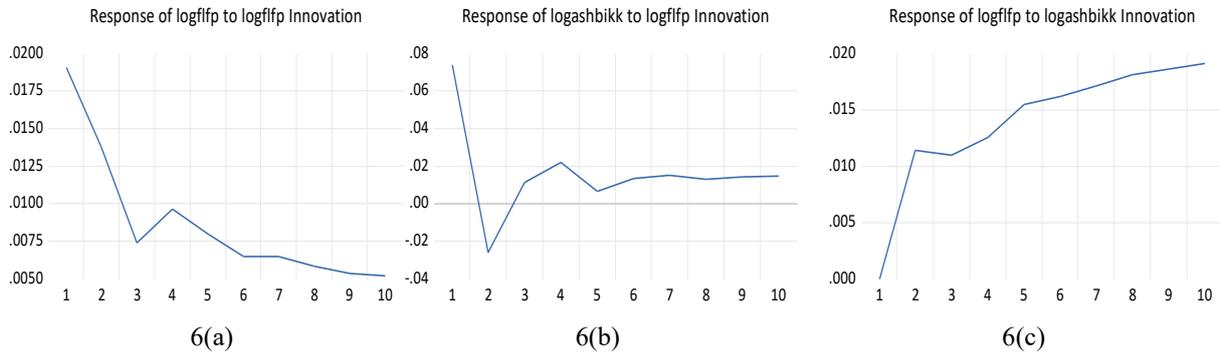
When examined for Model I in Figure 5(a), $\log flfp$ fell rapidly in the third period following a shock, then gradually declined to return to a stable state. Figure 5(b) shows that $\log spkspn$ changed with $\log flfp$ shocks. $\log spkspn$ reached its lowest level in the second period following the shock, then began to rise rapidly until the fourth period, after which it returned to a stable state. Figure 5(c) shows that $\log flfp$ changes with $\log spkspn$ shocks. $\log flfp$ rose rapidly towards the second period and then returned to a stable state.

Figure 5. Impulse Response Function for Model I



When examining Model II, as shown in Figure 6(a), logflfp reached its lowest point in the third period after a shock, then peaked in the fourth period and gradually declined towards the tenth period. Figure 6(b) shows that logashbikk changed with logflfp shocks. logashbikk rapidly declined to its lowest point in the second period after a shock, then peaked in the fourth period and subsequently stabilised. Figure 6(c) shows how logashbikk changed according to logflfp shocks. logashbikk rose rapidly until the second period after the shock, then achieved a stable upward trend from the fifth to the tenth period.

Figure 6. Impulse Response Function for Model II



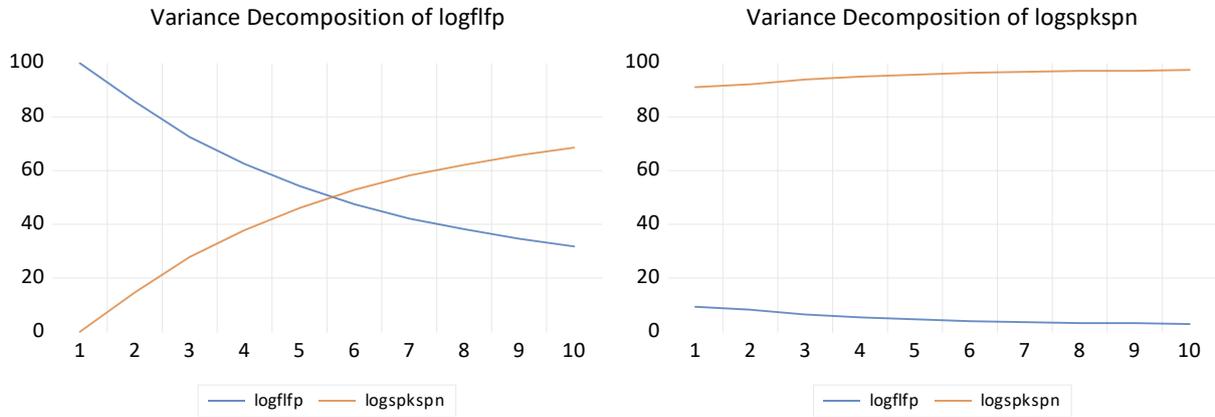
Generally speaking, shocks have large effects on logspkspn, logflfp and logashbikk in the short term, and the effects are gentle in the long term. But the response of logflfp to logashbikk have large in the long run.

5.7. Variance Decomposition

Varyans ayrıştırması ortalama karesel hatayı her bir değişkenin katkılarına paylaşır (Zou, 2018). Aslında varyans ayrıştırması, bir değişkendeki değişikliklerin bir diğerini nasıl etkilediğini incelemek için kullanılan bir araçtır ve göreceli etkiler hakkında bilgi verir. Varyans ayrıştırması için elde edilen sonuçlar, Model I için Şekil 7'de gösterilmektedir.

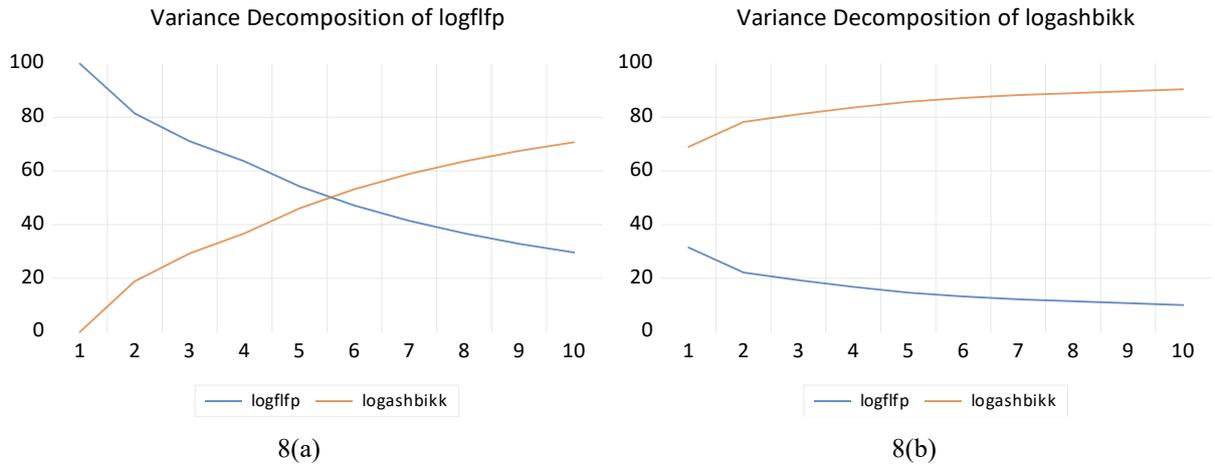
When examining Model I according to Figure 7(a), the estimated variance of logflfp gradually decreased from the first period, reaching 32% in the tenth period. On the other hand, the contribution of logspkspn gradually increased from 0% in the first period to 68% in the tenth period. According to Figure 7(b), in the estimated variance of logspkspn, the contribution of logflfp is 9% in the first period, gradually decreasing to 3% by the tenth period. The contribution of logspkspn, on the other hand, is 90% in the first period, gradually increasing to 97% by the tenth period.

Figure 7. Variance Decomposition for Model I



The analysis for Model I is shown in Figures 8(a) and 8(b). According to Figure 8(a), the contribution of logflfp to the estimated variance gradually decreased from the first period onwards, reaching 29% in the tenth period. On the other hand, the contribution of logashbikk gradually increased from 0% in the first period to 71% in the tenth period.

Figure 8. Variance Decomposition for Model II



Şekil 8(b)'ye göre, logashbikk'in tahmini varyansında, logflfp'nin katkısı ilk dönemde %31 iken, onuncu döneme kadar kademeli olarak %9'a düşmüştür. logashbikk'in katkısı ise ilk dönemde %69 iken, onuncu döneme kadar kademeli olarak %90'a yükselmiştir.

6. DISCUSSION AND CONCLUSION

According to 2024 data, the female employment rate in Türkiye is 42.2%, while the average for OECD countries is 67.1%. This significant disparity highlights the relatively low employment level of women in Türkiye and underlines the need to increase efforts to increase participation of women in the labour market.

Macroeconomic challenges should be addressed by taking into account the specific circumstances of each country. Considering that a significant proportion of women in Türkiye are mothers and that the responsibility of caring for children aged 0-6 is predominantly borne by women, policies aimed at increasing maternal employment are expected to directly contribute to women's lfp. In this context, it is of great importance to examine the relationship between access to private childcare services and mothers' lfp. Determining the role and potential impact of private childcare services on women's employment would provide valuable insights into existing challenges and opportunities.

The results of the analysis show that the number of students enrolled in private kindergartens and nursery schools, enrolled in kindergartens affiliated to the MoFSS, and enrolled in kindergartens opened in enterprises has a negative effect on mothers' lfp in the long run. In the short run, the number of students enrolled in private kindergartens and nursery schools, enrolled in nurseries affiliated to the MoFSS, and enrolled in nurseries opened in enterprises had a positive effect on mothers' lfp. These results show that private childcare services do not contribute much to maternal employment in Türkiye. This is because low-income families cannot access private childcare services due to high costs. Therefore, its impact on mothers' lfp has been limited. Moreover the analysis provided evidence that COVID-19 has reduced lfp both in the long run and in the short run. However, this effect is higher in the short run. This result can be interpreted as that COVID-19 causes a major shock in the labour market in the short run, but this effect gradually decreases in the long run. The other analysis result shows that the number of students enrolled in private kindergartens and nursery schools, schools affiliated to MoFSS, and nursery schools opened in enterprises is not the Granger cause of women's lfp. On the contrary, female lfp is the Granger cause of the number of students enrolled in private kindergartens and nurseries, nurseries affiliated to the MoFSS, and nurseries opened in enterprises. This result indicates that the need for private childcare increases as more women join the labour force in Türkiye. In this context, unlike a demand-driven childcare market, the supply of private childcare should be made more flexible to encourage mothers to join the labour force.

First and foremost, state-subsidised subsidies should be provided to families wishing to use private childcare services. Such subsidies not only increase accessibility but also encourage mothers to participate in the labour force. For example, in the US, the state both regulates and subsidises the private childcare market (Morrissey, 2017). Similarly, a study in Norway found that universal childcare subsidies led to a shift from informal to institutional care but did not directly increase employment (Havnes & Mogstad, 2011). Therefore, subsidies in Türkiye should be structured to prioritise working mothers and their impact should be enhanced by making them conditional on employment.

Graduated subsidies according to income groups are important for the development of fair and targeted support policies. Viitanen's (2011) findings on the childcare voucher system reveal that it enables low-income families to turn to private childcare. In Türkiye, a similar voucher or support system can facilitate access to childcare services for disadvantaged groups.

Employer-sponsored childcare services are an important model that supports working women to remain in employment. While such practices are supported by tax incentives in the US and some EU countries (Hegewisch, 2017), in Türkiye there is only a limited obligation for enterprises with more than 150 female employees. This practice should be transformed into a more flexible and widespread structure. For example, in the model implemented by the Martur company, both care and transport support was provided to contracted nurseries for the children of female employees; as a result, applications increased, employee loyalty strengthened and production quality improved (Essmat, 2017).

Expanding care services for children aged 0-2 is also of critical importance. The care gap in this age group directly affects mothers' decisions to return to work. Some programmes in the USA have accelerated the transition to centre-based childcare services and emphasised the importance of arrangements for this age group (Crosby et al., 2005).

Regional inequalities are also among the important factors shaping employment of women. The inadequacy of public care services in the east and southeast of Türkiye limits women's transition to the labour market in these regions (SPO, 2001; The Turkish Statistical Institution [TSI], 2024). In this context, innovative solutions such as mobile kindergartens in rural areas can be developed by taking regional incentive systems implemented in countries such as Spain or Germany as an example (MoFSS, 2023).

The integration of childcare services with part-time and flexible working models is very important for the sustainability of women's employment. In Scandinavian countries, flexible working and childcare services are integrated and this allows women to remain productive without leaving the labour force (Misra et al., 2011). Similarly in Türkiye, flexibilisation of the service hours of care centres should be supported by flexible working arrangements.

The success of all these policies depends on reliable and comprehensive data infrastructure. In Türkiye, micro data on maternal employment are very limited. This situation makes both academic studies and policy design difficult. The elaboration and publicisation of national data sets would enable decision makers to develop more targeted and effective practices.

In conclusion, access to childcare services in Türkiye is not only a social policy issue but also a fundamental requirement for economic growth and social development. The recommendations presented above can form the basis of an inclusive and holistic policy vision that brings together the Scandinavian welfare state approach, the Anglo-Saxon flexibility model and Türkiye's unique structural dynamics.

The limitation of the study is the limited data on maternal employment or lfp of mothers in Türkiye. Therefore, the study examines the lfp of women aged 25-34 (married/cohabiting/living together). The lfp of women aged 25-34 is considered because women in this age group are more likely to have one or more children aged 0-6. Therefore, other age groups are excluded from the study. In addition, divorced women are excluded since it is uncertain whether they have children or not. It is considered that the most appropriate subset is selected in the study. In future studies, differences in results can be determined by using different subset data sets. In addition, making micro data sets on maternal employment publicly available would encourage studies in this field and enable international comparisons.

DECLARATION OF THE AUTHOR

Declaration of Contribution Rate: The author contributes the study on her own

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